

EXHIBIT B



US006738640B1

(12) **United States Patent**
Baker et al.

(10) **Patent No.:** US 6,738,640 B1
(45) **Date of Patent:** May 18, 2004

(54) **RADIO COMMUNICATION SYSTEM**

(75) **Inventors:** Matthew P. J. Baker, Canterbury (GB); Timothy J. Mousley, Caterham (GB); Bernard Hunt, Redhill (GB)

(73) **Assignee:** Koninklijke Philips Electronics N.V., Eindhoven (NL)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 09/478,838

(22) **Filed:** Jan. 6, 2000

(30) **Foreign Application Priority Data**

Jan. 16, 1999	(GB)	9900910
May 20, 1999	(GB)	9911622
Jul. 2, 1999	(GB)	9915569
Sep. 24, 1999	(GB)	9922575

(51) **Int. Cl.**⁷ H04Q 7/20

(52) **U.S. Cl.** 455/522; 455/69; 455/375.1; 370/331

(58) **Field of Search** 455/522, 69, 575.1; 370/331

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,056,109 A	10/1991	Gilhouse et al.	375/1
5,896,411 A	4/1999	Ali et al.	375/130
6,347,231 B1	2/2002	Miya	455/522
6,434,130 B1	8/2002	Soininen et al.	370/331

6,463,073 B1	10/2002	Bontu et al.	370/442
2002/0115461 A1	8/2002	Shiraki et al.	455/522

FOREIGN PATENT DOCUMENTS

WO	9726716 A2	7/1997	H04B/7/005
WO	9726716 A3	7/1997	H04B/7/005

OTHER PUBLICATIONS

Patent Abstract of Japan: Publication No.: 10224294 A, Date of Publication of Application: Aug. 21, 1998. Intl. Cl. H04B 7/26.

* cited by examiner

Primary Examiner—Nay Maung

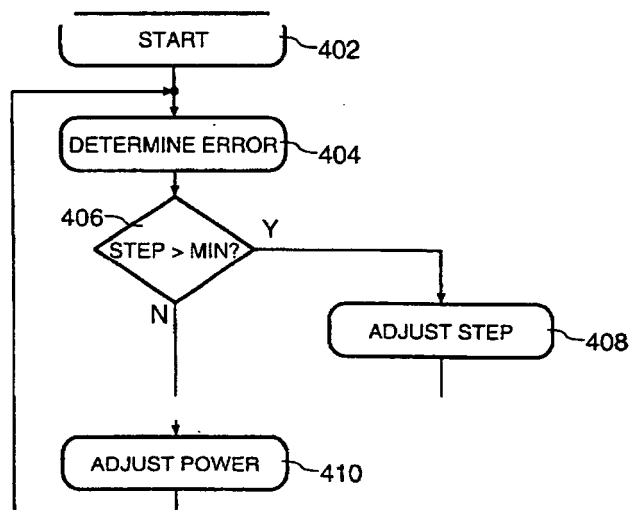
Assistant Examiner—Alan T. Gantt

(74) *Attorney, Agent, or Firm*—Jack D. Slobod

(57) **ABSTRACT**

A radio communication system has means for improving power control of a communication channel for the transmission of data after an interruption in the transmission. This is done by applying power control in steps of variable size at the start of a transmission, using a large step size initially which is reduced as the power approaches a target value. In one embodiment the step size is reduced when the sign of a power control command reverses, while in another embodiment the step size is reduced after a predetermined time. These techniques reduce the time taken for power control to be established, thereby addressing the problem that data transmissions at the start of a data channel are likely to be corrupted if the power level is too low, or to generate extra interference if the power level is too high.

20 Claims, 3 Drawing Sheets



U.S. Patent

May 18, 2004

Sheet 1 of 3

US 6,738,640 B1

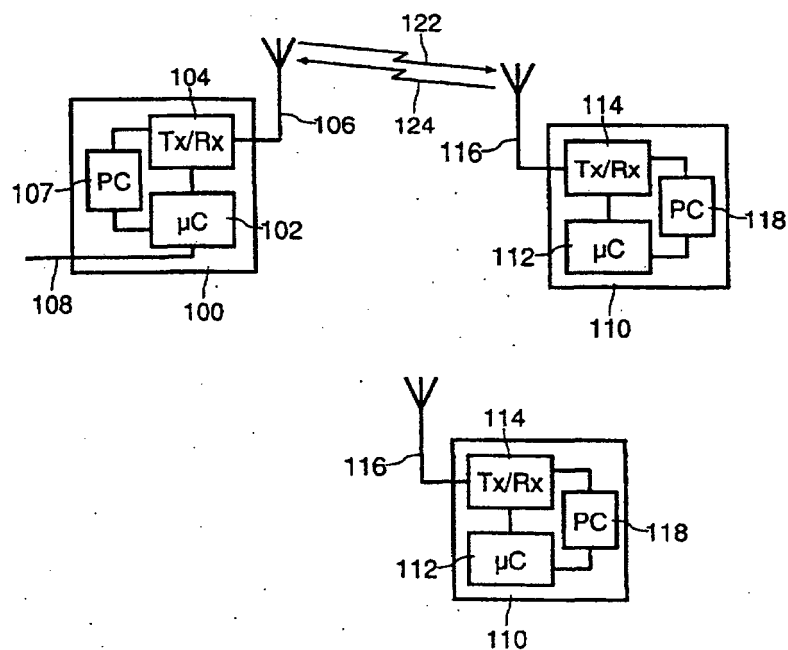


FIG. 1

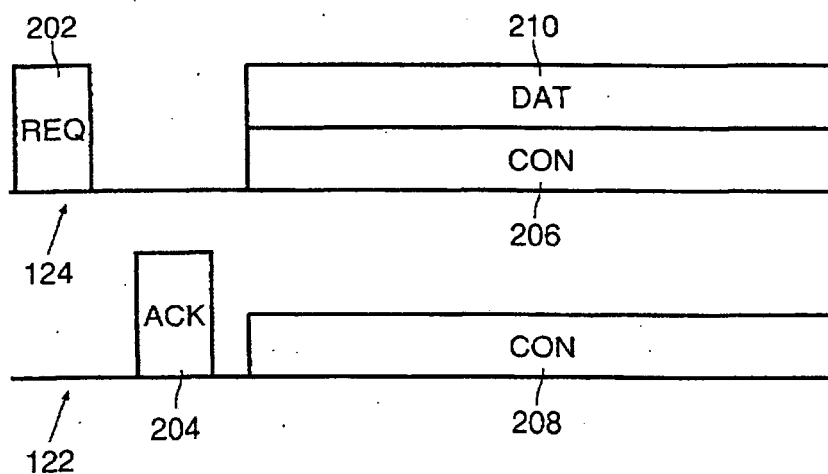


FIG. 2

U.S. Patent

May 18, 2004

Sheet 2 of 3

US 6,738,640 B1

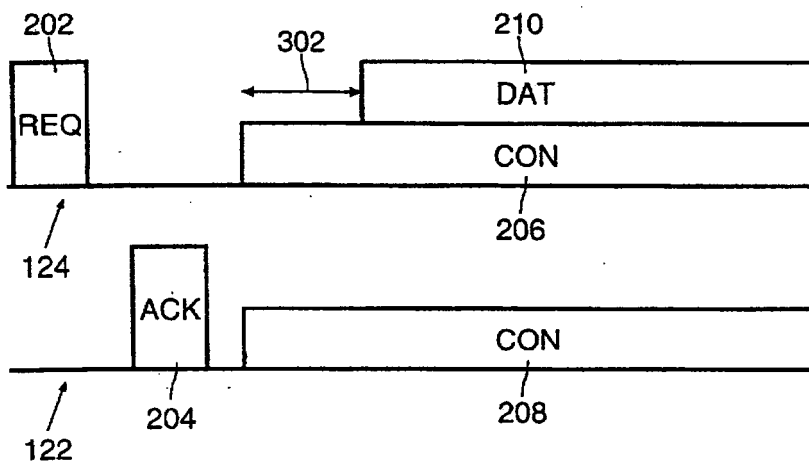


FIG. 3

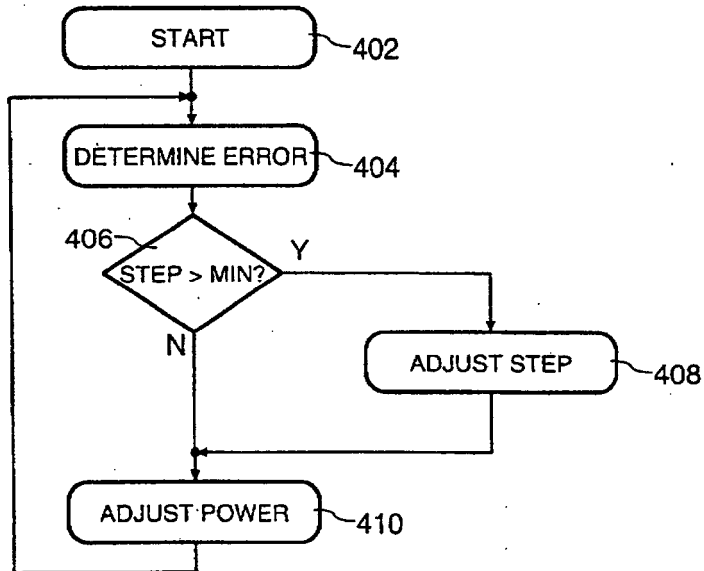


FIG. 4

U.S. Patent

May 18, 2004

Sheet 3 of 3

US 6,738,640 B1

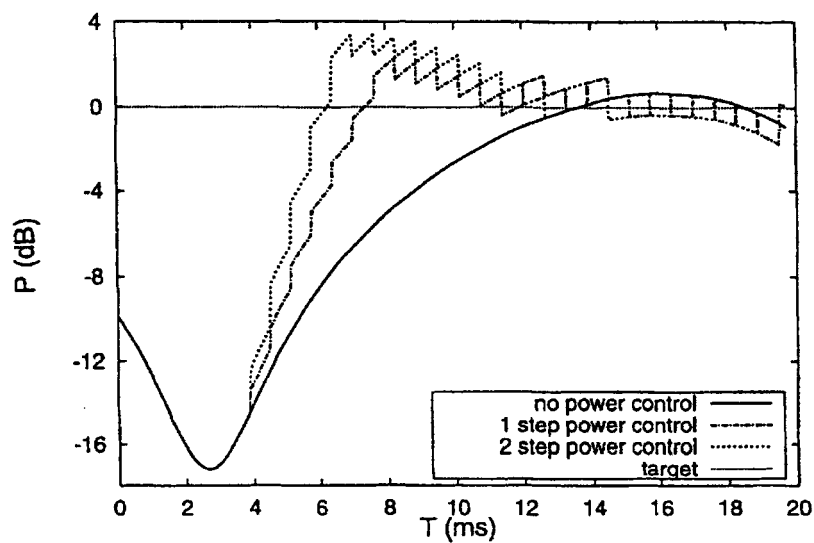


FIG. 5

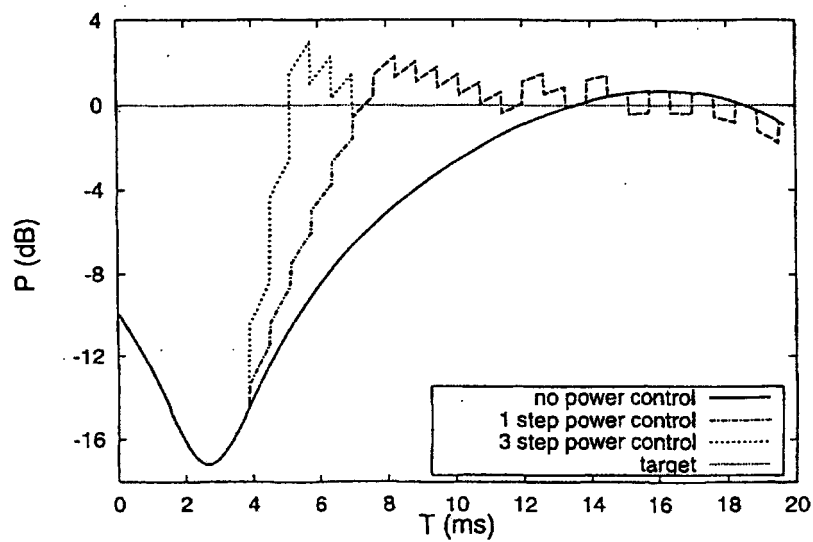


FIG. 6